UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

SEP 27 2000

REPLY TO THE ATTENTION OF

SR-6J

Mr. James L. Warner
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155

Re: Pine Bend Sanitary Landfill Superfund Site, Inver Grove Heights, Minnesota

Dear Mr. Warner:

The U. S. Environmental Protection Agency (U.S. EPA) has reviewed the Five-Year Review Report and the Addendum to the review developed by the Minnesota Pollution Control Agency (MPCA) for the subject site. Because hazardous substances, pollutants, or contaminants will remain at the Pine Bend Sanitary Landfill, EPA or the MPCA, if authorized to do so by EPA will conduct the next five-year review by December 31, 2004. The report is hereby approved.

U.S. EPA appreciates your efforts in conducting this review. If you have any questions, please contact Tim Prendiville at (312) 886-5122.

Sincerely,

William E. Muno, Director
Superfund Division

Attachment

cc: Tim Prendiville, U.S. EPA
Joe Julik, MPCA

FIVE-YEAR REVIEW REPORT

PINE BEND SANITARY LANDFILL SW-45
INVER GROVE HEIGHTS, MINNESOTA

September 5, 2000

Prepared By:
Minnesota Pollution Control Agency
Saint Paul, Minnesota 55155

Micheal Kanner, for MK
Section Manager
Remediation Section

Date 9/20/00

I. INTRODUCTION

A. PURPOSE

The Minnesota Pollution Control Agency (MPCA) has conducted a Five-Year Review of the Remedial Action (RA) work associated with facility RODs, see below, at the Pine Bend Sanitary Landfill (PBSL). This review was intended to evaluate whether the RA remains protective of public health and the environment.

Section 121 of the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and Section 300.430(f)(4)(ii) of the National Oil and Hazardous Substance Contingency Plan (NCP), require that periodic (no less often than five years) reviews are to be conducted of sites where hazardous substances, pollutants, or contaminants remain at the site above levels that will not allow for unlimited use or unrestricted exposure following the completion of all remedial actions.

OSWER Directives 9355.7-02 (Structure and Components of Five-Year Reviews, May 23, 1991) and 9355.7-02A (Supplemental Five-Year Review Guidance, July 26, 1994) provides that the U.S. EPA will conduct five-year reviews as a matter of policy (Policy Review) at: (1) sites where no hazardous substances will remain above levels that allow unlimited use and unrestricted exposure after completion of the RA, but the cleanup levels specified in the Record of Decision (ROD) will require five or more years to attain; or (2) sites addressed pre-SARA for which the remedy upon attainment of the cleanup levels, will not allow unlimited use and unrestricted exposure. The five-year review of the PBSL RA was conducted in accordance with this policy.

The MPCA conducted this five year review which consisted of: (1) a review of all documents associated with the RODs for PBSL; and (2) a review of site inspection documentation.

B. SITE BACKGROUND

This Five-Year Review and the corresponding supporting documents will become part of the Pine Bend Sanitary Landfill Record and are available for public review. The Pine Bend file is located at:

Minnesota Pollution Control Agency
520 Lafayette Rd

Saint Paul, Minnesota

PBSL signed a Response Order by Consent with the MPCA in April 1985. In November 1986 and October 1987 Remedial Investigation (RI) reports were completed. The 1985 Consent Order was replaced in October 1990 by an Amended Consent Order emphasizing completion of the Remedial Investigation/Feasibility Study (RI/FS). The remedial activities at PBSL were divided into three distinct operable units as follows: Operable Unit 1 – Permanent Alternate Water Supply (Extension of City of Inver Grove Heights water supply); Operable Unit 2 – Source Control (Landfill Cover) and; Operable Unit 3 – Ground Water Management (Monitoring and InSitu Bioremediation).

1.0 Site History

The Pine Bend Sanitary Landfill is located at 2495 East 117th Street in the City of Inver Grove Heights, Dakota County, Minnesota (Section 33, Township 27 North, Range 22 West). PBL is an open, operating, solid waste facility that accepts municipal solid waste and non-hazardous industrial waste. The PBL has operated as a sanitary landfill since 1971 under MPCA Permit SW-045. The permit was most recently reissued for the facility on September 15, 1997.

PBL was added to the National Priorities List (NPL) on June 10, 1986 based on detection of volatile organic compounds (VOCs) in ground water. Under an agreement between the United States Environmental Protection Agency (USEPA) and MPCA, the MPCA assumed regulatory primacy on the site.

Under the MPCA's direction and oversight, PBL conducted numerous response activities, including the following between 1986 and 1994:

Remedial Investigation (RI), 1986;
Additional RI activities, 1987;
Pump Test, 1989-1990;
Preliminary Alternatives Report, 1989;
Ground Water Monitoring, 1988-1999;
Final Remedial Investigation Report, 1991; and
Detailed Analysis Report, 1994.

The Record of Decision (ROD) for Operable Unit #1 (the first phase of a permanent remedy for the Site) was signed by the USEPA and MPCA on September 30, 1991. The ROD called for extending the existing City of Inver Grove Heights municipal water supply, the connection of impacted or potentially impacted residents to the municipal water supply, and the permanent sealing of residential water supply wells in the impacted area. This work was completed in November 1994.

In September 1995, the MPCA and USEPA signed a ROD calling for no further action at the site under CERCLA, as source control (Operable Unit 2) actions and addressing impacts to ground water (Operable Unit 3) would continue to be conducted under the facility's operating permit (Permit SW-045). At this time PBSL had Financial Assurance in place which assured long term care of this facility. Work done under the permit on Operable Units 2 and 3 are discussed below. The facility was removed from the NPL (delisted) in 1998.

This five-year review is being prepared in accordance with the delisting order, pursuant to USEPA, Office of Solid Waste and Emergency Response (OSWER), Office of Emergency and Remedial Response Directives 9355.7-02 and 9355.7-02A.

2.0 Site Contamination Problems

The PBSL site occupies 366 acres of which roughly half is areas of mixed municipal solid waste landfill. The site is located in an industrial area and is bordered on the north by the Crosby American Demolition Landfill and on the south by the SKB Rich Valley Demolition Landfill. To the east of the PBSL is an NSP generating facility and what was open space and farmland during the time of the RI but is now being developed as commercial property. Also, at the time of the RI there were approximately twelve homes with private drinking water supplies.

The filling operations began in 1971 with both non-hazardous industrial waste and mixed municipal solid waste. The rate of disposal changed over the years. For example, the average rate of disposal in 1987 was 60,000 tons per month. whereas in 1994 the rate of disposal was 16,000 tons per month.

The PBSL site is located approximately one mile west of the Mississippi River in an area where the ground surface is about 200 to 250 feet above the river level. The ground surface elevation on and around the site varies from 850 to 950 feet mean sea level (MSL) with the top of the landfill itself exceeding 1,000 feet MSL.

In the vicinity of PBSL, the bedrock is overlain by a thick sequence of glacial drift. At the surface the drift consists of sand and gravel outwash deposits. Shallow groundwater in the PBSL area is present in the surficial drift at depths of 90 to 210 feet below ground surface. The ground water flow beneath the site is to the east/northeast and the average linear velocity of the ground water in the glacial drift aquifer is estimated to range from 240 to 1900 feet/year.

An extensive monitoring system is present around the PBSL. A wide range of compounds, both organic and inorganic, have been detected in the groundwater samples form the PBSL area. The highest concentrations of volatile organic compounds (VOCs) are found in samples from

monitoring wells located in closed proximity to the PBSL. Freon compounds are the most prevalent of the VOCs, but chlorinated solvents are also present in substantial concentrations in samples from many of the wells.

II. SUMMARY OF RESPONSE ACTION

A. REMEDIAL OBJECTIVES

The following remedial action objectives were developed for the PBSL site:

- Be protective of human health and the environment. Reduce risks due to dermal, ingestion, or inhalation exposure to contaminants.

Reduce the potential for mobile contaminants in soils and waste areas to migrate and further contaminate groundwater through containment, i.e. landfill capping.

- Long term remediation of the groundwater down gradient of the landfill.

- Attain applicable or relevant and appropriate requirements (ARARs) of State and Federal regulations and health-based levels, and provide long-term protectiveness through containment.

- Be cost effective.

- Utilize permanent solutions to the maximum extent practicable.

B. REMEDY AS DESCRIBED IN THE SEPTEMBER 1991 ROD AND THE October 1994 UPDATED DETAILED ANALYSIS REPORT, PINE BEND SANITARY LANDFILL, INVER GROVE HEIGHTS, MINNESOTA

The Operable Unit 1 ROD for PBSL was signed on September 30, 1991. Both landfill cover and groundwater monitoring and remediation are being addressed through PBSL's solid waste permit

with MPCA. The major components of the selected remedy include:

Operable Unit 1, Permanent Alternate Water Supply: Pine Bend Landfill Inc. reached agreement with the city of Inver Grove Heights, MPCA, and others in the spring of 1993 regarding the scope of the alternative water supply. The Southern Water System Project (SWSP), exceed the scope of the MPCA ROD. The SWSP began in June 1993 and was completed by December, 1994. The alternative water supply removed the ground water exposure pathway by replacing private water supplies, formerly in the path of the ground water plume with a municipal water supply.

Operable Unit 2, Source Control: Under the MPCA solid waste permit the source control is accomplished by installing a low permeability cap over the unlined portions of the landfill. The closed portions of the landfill have an active gas collection system that collects the landfill gas and uses it to generate electricity. As part of the active gas system the leachate condensate is collected and shipped of site for proper treatment and or disposal. All of these measures serve to reduce leachate generation and or remove contaminants from the landfill system and reduce further contamination of the ground water.

Operable Unit 3, Ground Water Management: The ground water management operable unit is being addressed by two methods. One, as mentioned above, the PBSL has a comprehensive ground water management system. The ground water monitoring system is maintained, sampled and reported to the MPCA quarterly. Secondly, the existing ground water plume is being remediated, in part, with InSitu Bioremediation. PBSL is currently in its 3rd year of a pilot project implementing this technology.

Additionally institutional controls designed to supplement engineering controls. These include: access restrictions to assure future use of this site does not increase the release or potential release of hazardous substances to the environment or become dangerous to the life or health of people; and installation of a fence to protect the public from direct contact and to prevent disturbance of the cover.

C. REMEDY IMPLEMENTATION

The Remedial Actions were constructed and documented in accordance with the approved plans and specifications. The selected remedy met the goals of the remedy as discussed below:

Fencing, Deed and Access Restrictions

The objective of the institutional control element of the response action was to place sufficient deed and access restrictions to ensure that: 1) the integrity of the cap or soil cover is not compromised; 2) no construction particularly of drinking water wells occurs onsite or down gradient of the site which may increase the likelihood of exposure to remaining contaminants; and 3) there is no interference with operation and maintenance of the treatment and monitoring systems. To achieve these objectives a security fence is installed around the perimeter of the site to meet institutional control requirements in the ROD. The fence is standard chain link construction topped with barbed wire. Gates are located at various points along the fence length to permit access to off-site elements of the remedy such as ground water monitoring wells. This fence will be maintained during the operating life and post closure period (indefinitely) of the landfill.

Landfill Cap and Cover

The functional intent of the Landfill Cap and Cover is to eliminate direct contact and intercept direct precipitation and divert it from contact with underlying waste materials thereby reducing leachate generation. The cover was constructed with a buffer layer between the waste and the barrier layer soils, a 2-foot barrier layer with a maximum permeability of 2 x 10-6 cm/sec, a six inch drainage layer, and an 18-inch top layer, of which the top 6 inches is topsoil capable of supporting vegetation.

Groundwater Monitoring Program

The ground water remediation (Operable Unit 3) is being addressed with InSitu Bioremediation. PBSL is currently in its 3rd year of a pilot project implementing this technology. This technology provides additional nutrients to anaerobic microorganisms, improving their effectiveness to biodegrade chlorinated hydrocarbons. Additionally a comprehensive ground water monitoring system is maintained, sampled and reported to the MPCA quarterly.

Landfill Gas Venting System, Sampling and Gas Migration Monitoring

An active gas system through the waste removes methane from the fill along with VOCs for destruction in the gas to energy plant. Leachate is removed from the waste via the gas system and also directly pumped out of some of the gas extraction wells. This further acts to keep contaminants out of the ground water. Operation and Maintenance of the cap and cover are on

going.

1. Be Protective of Human Health and the Environment

The remedy selected was based on potential to provide future endorsement to public health, welfare, and the environment. Site records provided reasonable evidence that quantities of contaminants existed in the PBSL.

The selected alternative was considered to be protective of human health and the environment. The fencing, institutional controls, gas and leachate extraction system, ground water treatment system and cover system would provide protection from direct contact with contaminated materials and promote long term cleanup and protection of the ground water beneath and down gradient of the site.

Monitoring the groundwater and gases would identify any failures of the containment system existing at the landfill. Should elevated levels of contaminants be detected, additional corrective measures would be taken to abate any threat.

2. Attain Applicable or Relevant and Appropriate Requirements (ARARs) of State and Federal regulations

Selection of the site capping was determined to comply with state regulations. The selected remedial alternative was also determined to comply with specific public health and environmental requirements. These ARARs are referred to as “chemical specific” requirements. Public health and environmental ARARs expressed as chemical-specific limits or requirements would be addressed by routine monitoring of groundwater, surface water and vented gas.

3. Cost Effectiveness

The selected remedy would comply with relevant portions of the State ARARs. The range of alternative actions that met ARAR requirements was limited. The selected alternative was cost effective since it was the least expensive alternative that satisfied the regulations. Cost effectiveness of the selected alternative was established relative to other alternatives which would have higher costs and essentially met the same ARARs without significantly increasing the benefit to human health and the environment. The selected alternative was determined to be the most cost effective alternative which will meet all ARARs over time.

4. Utilization of Maximum Extent Practicable

A remedy involving containment, an alternative water supply, active gas removal and destruction and ground water cleanup was selected for the PBSL. The remedies were evaluated and judged to be practicable for the site.

The Remedial Action systems were tested for operation integrity and found to comply with the intent for the Remedial Design.

D. Operation and Maintenance Remedy Implementation

The long term remedial action requirements at the site for O&M include, but are not limited to the following:

1. Periodic mowing and inspection of the final cover system;
2. Long term operation and maintenance of all groundwater treatment and gas systems; and
3. Periodic sampling and testing of groundwater monitoring wells, leachate collection systems, gas to energy system and gas monitoring probes.

III. SUMMARY OF SITE VISIT

Facility Inspections

The MPCA inspects the PBSL twice per year. Additionally Dakota County environmental staff inspect the site twice per month. All county inspection reports are forwarded to the MPCA for review. It should be noted that the Pine Sanitary Landfill, in addition to the closed portion of the landfill, which this report addresses, is also an open operating landfill. Many of the inspection comments are associated with the operating portion of the landfill.

The four most recent facility inspections prior to completion of the Five-Year Consent Order Update occurred on November 9, 1999, November 17, 1999, December 6, 1999 and December 9, 1999. Dakota County Environmental Management Solid Waste Inspection Reports from each of the inspections are attached. The reports are each signed by representatives of BFI and Dakota County.

The November 9, 1999 inspection was attended by Van Anh Tang and Mike Ayers from PBL and Bill Lauer from Dakota County. The county's comments/conclusions from the inspection are as follows:

Some additional waste cover is needed near the working face area to cover exposed waste.
Some litter needs picking around the site and from trees across railroad tracks to the east.
The Phase IV cell is prepared and ready for waste. Electrical system for leachate pump is getting worked on to be operational prior to waste getting placed in the cell. State has given verbal approval for this cell to receive waste.

The November 17, 1999 inspection was attended by Van Anh Tang and Mike Avers from PBL and Bill Lauer from Dakota County. The conclusions from the inspection are as follows:

Good litter control.
Electrical system for new lined area (Phase VI cell) leachate removal is energized.
Working face is in Phase IV hole-covering liner with six feet of waste.
Extra covers are getting applied to the Phase I, II and III liner area and asbestos waste is still getting landfilled in this location along with waste from methane system installation.

The December 6, 1999 inspection was attended by Van Anh Tang and Mike Ayers from PBL and Bill Lauer, Terry Muller and Jennifer Mlynex from Dakota County. The county's comments/conclusions from the inspection are as follows:

Methane system over Phase III is connected. Electrical is getting installed to pumps from condensate.
Areas along berms in final cover that have settled in Phase I and II are getting drains installed.
Drainage system is getting installed above the clay portion of the liner. These systems are draining water that has settled in these areas.
Additional covers have been added over Phase III – OK.
Additional daily cover is needed over waste in Phase IV-Milwaukee Depot alternative cover soils will be arriving tomorrow (December 7, 1999) for use as cover in this area.

The December 9, 1999 was attended by Mike Ayers from PBL and Bill Lauer and Terry Muller from Dakota County. The county's comments/conclusions from the inspection are as follows:

Collected samples for analysis from waste soil for use as cover (Dakota County Parks).

- More daily cover needed over waste in portion of landfill exposed to heavy vehicle traffic.
- Incoming waste observed – OK.
- Liner from protective cover – straw and thermal blanket is getting deployed along the top half of side slopes. Straw layer observed to be in excess of requested six inches.

Site visits will occur periodically. The latest site visit associated with this report took place on December 9th, 1999. This five year review consisted of the following activities: a review of relevant documents, discussions with representatives of the O&M contractor and a site inspection. The completed report will be submitted to the U.S. EPA and a copy will be placed in the MPCA files. Notice of its completion will be placed in the local newspaper and local contacts will be notified by letter.

Cover System

The cover system was found to be in relatively good condition. The vegetative cover was thorough and abundant. The cover is being mowed frequently enough to keep a balance between enhanced evapotranspiration, promotion of surface runoff and allow for cover system inspections

Gas Venting System

The gas vents and gas monitoring probes appear to be in good working order and free from obstacles.

Groundwater Monitoring Wells

Overall, the general quality of the wells appear to range from fair to good. The wells appear to be in working order.

Review of ARARs

Potential federal ARARs of the ROD consist of the Clean Water Act (40 CFR), the Clean Air Act, National Ambient Air Quality Standard, and OSHA and DOT standards.

Potential State ARARs are listed below as they appear in the ROD/PBSL Solid Waste Permit.

Chemical Specific

- WAC NR 140 groundwater standards
- Ground water quality standards as stated in Minnesota Rules, Chapter 7035.2815

Action Specific

- Capping requirements as stated in Minnesota Rules, Chapter 7035.2815

Location Specific

- None identified

Based upon a review of site information, it appears that all federal and State environmental ARAR requirements for on-site activities identified in the ROD are being compiled with. ARARs for the selected remedies are listed below.

IV. ASSESSMENT

The following conclusions support the determination that the remedy at the Pine Bend Sanitary Landfill site remains protective of human health and the environment.

Effectiveness of Remedy: As noted above, the cover system is intact and the venting and monitoring systems are operating as intended. The cap appears to be adequate and controlled vegetation, and there are no signs of erosion. The contaminant levels in the groundwater at the site appear to be consistent with expectations. Institutional controls are in place. Although these factors appear to indicate that the remedial actions continue to be effective, groundwater monitoring and gas migration results indicate that several areas of the site continue to be impacted. The contaminant levels exceed State ARARs. Pine Bend Landfill will continue to monitor the groundwater and gas level at the site for effectiveness.

Overall, these factors indicate that the remedial actions continue to be effective.

V. DEFICIENCIES

Except for inspection items noted above that are ongoing and address primarily operation of the open portion of the landfill, no further deficiencies.

VI. RECOMMENDATIONS

It is recommended that and operation and monitoring continue in accordance with the approved schedules.

VII. STATE OF PROTECTIVENESS

There are no residences impacted by the Pine Bend Landfill, either by a potential risk due to drinking ground water or exposure to landfill gas. The potential risk due to drinking ground water was removed by extending the existing City of Inver Grove Heights municipal water supply to potentially impacted residents, and the permanent sealing of residential water supply wells in the potentially impacted area. Landfill gas generated at the facility is actively recovered

and processed for energy recovery at an on-site gas to energy plant. Landfill gas monitoring is conducted at least monthly at the facility property boundary to monitor for methane migration. Expansion of the methane gas recovery system also occurred during the fourth quarter of calendar year 1999. With continued implementation of the remedial action pursuant to the Record of Decision and the facility's operating permit (Permit SW-045), the remedy selected for the PBSL remains protective of human health and the environment.

VIII. NEXT REVIEW

The five-year reviews for this site will be continued until groundwater cleanup standards are met as a matter of policy. The next five-year review will be conducted within five years of this report. The completion date of this report is shown on the signature cover. The next report date is tentatively set for December 31, 2004.